

REMARKS**I. Status Of The Claims**

Claims 1-83, 85-90, and 92-94 are pending in this Application.

Claims 80-83, 85-90, and 92-94 are allowed.

Claims 34 and 47 are objected to as being dependent upon a rejected base claim.

Claims 1, 2, 4, 11, 12, 14, 21-23, 25, 35, 36, 38, 48-54, 56, 64-69, 71, and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (U.S. Patent No. 5,703,623) in view of March (U.S. Patent No. 5,999,167).

Claims 3, 5-10, 13, 15-20, 24, 26-33, 37, 39-46, 55, 57-63, 70, and 72-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall and March in view of Isoguchi (U.S. Patent No. 5,146,353).

With this response claims 1, 11, 21, 22, 35, 48, 49, 64, and 79 are amended.

II. Rejections Under 35 U.S.C. 103(a)

The Examiner has rejected claims 1, 2, 4, 11, 12, 14, 21-23, 25, 35, 36, 38, 48-54, 56, 64-69, 71, and 79 under 35 U.S.C. 103(a) as being unpatentable over Hall in view of Marsh, and has rejected claims 3, 5-10, 13, 15-20, 24, 26-33, 37, 39-46, 55, 57-63, 70, and 72-78 under 35 U.S.C. 103(a) as being unpatentable over Hall in view of Marsh and Isoguchi.

The claimed invention is, for example, directed to a coordinate input apparatus for inputting an absolute three-dimensional position in three-dimensional coordinates. This coordinate input apparatus receives light emitted by a light emission unit of a designation device (a remote controller) by a plurality of sensors, calculates and determines the absolute three-

dimensional position, in the three dimensional coordinates, of the light emission unit with regard to the coordinate input apparatus based on values corresponding to positions where the light is emitted on the plurality of sensors.

According to the claimed invention, for at least the reason that the three-dimensional position where the designation device exists with regard to the coordinate input apparatus is calculated based on a position relationship between a position of the designation device and a position of the coordinate input device, an absolute three-dimensional position of the designation device with regard to the coordinate input apparatus is obtained.

Thus, in the claimed invention, an absolute three-dimensional position in an absolute three-dimensional coordinate system can be detected, rather than relative moving amount and moving direction of the designation device.

Hall discloses a handheld cursor control device that senses changes to its own position and orientation by detecting six degrees of freedom (X, Y, Z, yaw, pitch and roll) in three dimensions of the hand held control device. Sensed information including relative moving amount and direction of the hand held cursor control device, instead of absolute moving amount and direction of the hand held cursor control device with regard to an external device, is transmitted to the external device.

Thus, the arrangement of Hall merely emulates an operation of a mouse with the handheld cursor control device. Hall fails, for instance, to calculate the absolute three-dimensional position of the hand held cursor control device with regard to the external device.

With regard to Marsh, the Examiner states:

“... Marsh et al teaches how his invention provides a cursor control device for use in 3-dimensional space [including] ... determining positional angular orientation of the remote member in 3-dimensional space ...

To the Examiner's understanding, this determination of the positional angular orientation of the remote member in 3-dimensional space relates to the concept of calculating an absolute 3-dimensional position."

Thus, the Examiner apparently contends that Marsh discloses the aspect of the claimed invention of:

"... determining the absolute three-dimensional position, in the three-dimensional coordinates, of said designation means with regard to said coordinate input apparatus..."
(emphasis added)

as stated by independent claim 1, and as similarly stated by independent claims 11, 21, 22, 35, 48, 49, 64, and 79.

The Applicant respectfully disagrees with the contention for at least the reason that March fails to disclose determination of a "three-dimensional position, in the three-dimensional coordinates" and instead discloses determination of "angular orientation" of receiver array 23 of remote unit 21 with respect to an X-axis and/or Y-axis, March disclosing an "angular orientation" as corresponding to a "rotation" of receiver array 23 about one of those axes:

"The receiver array 23 shown in FIG. 4 consists of four such sensors 52, designated as L (left) and R (right), corresponding to a horizontal or X-axis, and T (top) and B (bottom), corresponding to a vertical or Y-axis ... rotation about the vertical Y-axis, is determined by comparing the S_L and S_R signals, while up-down rotation of the array, that is, rotation about the horizontal X-axis, is determined by comparing the S_T and S_B signals ...

... using one sensor (of ultrasound receiver 23) on an axis as a reference, the positioning circuitry 25, 27 (detailed below) determines the time difference and therefore the phase difference between the signal zero crossings of that sensor/receiver element and the other sensor on that axis. The interpretation of the resulting phase relationship represents a specific angular orientation to the point source

transmitter 17 of the ultrasound.”

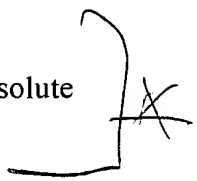
(See col. 4 ln. 31-42 and col. 5 ln. 40-47; emphasis added)

Accordingly, Marsh discloses only determination of an angle θ corresponding to “rotat[ion] about the Y-axis ... from the reference position” (see, for example, col. 4 lines 60-61, col. 5 ln. 2-16, and col. 5 ln. 40-47) and, similarly, determination of an angle ϕ corresponding to rotation about the X-axis (see, for example, col. 5 ln. 17-26 and col. 5 ln. 40-47).

Further, Marsh makes it clear that a user employs remote unit 21 not by, for instance, moving it among varying positions in three-dimensional space (e.g., positions corresponding to differing values of x, y, and/or z), but by tilting it up or down to indicate that an onscreen “cursor” should move on the y-axis of the screen, or by tilting it left or right to indicate that the onscreen cursor should move on the x-axis of the screen:

“... horizontal or vertical angular changes in position of the remote member 21 in three dimensional space then result in corresponding changes in cursor location on the TV 41 screen.”

(see col. 5 ln. 54-57; emphasis added).

Thus, Marsh fails to disclose, teach, or suggest “determination [of an] absolute three-dimensional position in the three dimensional coordinates” as stated in the claims. 

The Applicant submits that it is clear that mere disclosure of determining an angle corresponding to rotation about an X-axis and determining an angle corresponding to rotation about a Y-axis is not disclosure, teaching, or suggestion of “determination [of an] absolute three-dimensional position in the three dimensional coordinates” as stated in the claims for at least the reason that such angles, even taken in combination, describe only tilt and fail to describe a three-dimensional position in three-dimensional coordinates (e.g., x, y, z coordinates).

The Applicant respectfully observes, for instance, that knowing how an object is tilted in space does not provide one with enough information to know the three-dimensional

position of the object in three-dimensional coordinates (e.g., x, y, z coordinates), and that an object exacting a particular tilt could be occupying any three-dimensional position in three-dimensional coordinates (e.g., x, y, z coordinates).

The Applicant notes that, in contrast to that which is disclosed by the references, the claimed invention acts, for instance, to allow for input of an absolute three-dimensional position of a designation device by detecting absolute three-dimensional coordinates for an absolute three-dimensional position in an absolute three-dimensional coordinate system based on values corresponding to positions on which a light emitted by the light emission unit of the designation device indicates on the plurality of sensors in the three dimensional coordinates.

In view of at least the foregoing, the Applicant respectfully submits that all pending claims are in condition for allowance.

CONCLUSION

The Applicant respectfully submits that this Application is in condition for allowance for which action is earnestly solicited.

If a telephone conference would facilitate prosecution of this Application in any way, the Examiner is invited to contact the undersigned at the number provided.

AUTHORIZATION

The Commissioner is hereby authorized to charge any fees which may be required for this amendment, or credit any overpayment to Deposit Account No. 13-4500, Order No.

1232-4573. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

Furthermore, in the event that an extension of time is required, the Commissioner

is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-noted Deposit Account and Order No.

Respectfully submitted,

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By:



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